CLAIM AMENDMENTS

Claim 1 (Previously Presented):

A device for the characterisation of a flowing substance (20) comprising:

- a transport duct (30) on which is mounted a heating or a cooling element (40),
- a temperature difference sensor (50) comprising a first temperature measurement cell (51) downstream of the heating or cooling element and means (52) to determine a temperature difference in the flowing substance upstream and downstream of the heating or cooling element,
- flow control means comprising flow measurement means (61) for measuring a mass flow characteristic and flow correction means (62) for correcting for measured mass flow variations, and
- evaluation means (70) for evaluating a characterising feature of the flowing substance comprising a function relating temperature differences measured on one or more calibration substances to one or more characterising features of the flowing substance.

Claim 2 (Previously Presented):

The device according to claim 1, wherein the function comprises a data-base or a calibration equation.

Claim 3 (Previously Presented):

The device according to claim 1, further comprising a flow rate means for adjusting flow through the transport duct in a detection range of the temperature difference sensor.

Claim 4 (Previously Presented):

The device according to claim 1, wherein the flow measurement means (61) comprises a pressure measurement cell (90) for measuring a pressure difference over the temperature difference sensor (50) and the flow correction means (62) comprises a

pressure difference control means (91) for maintaining a substantially constant pressure difference over the temperature difference sensor.

Claim 5 (Previously Presented):

The device according to claim 1, wherein the flow measurement means (61) comprises a pressure measurement cell (90) for measuring a pressure difference over the temperature difference sensor (50) and the flow correction means (62) comprises a computing means for mathematically correcting the measured temperature difference for a measured temperature difference variation.

Claim 6 (Previously Presented):

The device according to claim 1, wherein the flow measurement means(61) comprises a mass flow sensor (110) measuring the mass flow through the temperature difference sensor (50) and the flow correction means (62) comprises a mass flow control means (91) for maintaining a substantially constant mass flow through the temperature difference sensor (50).

Claim 7 (Previously Presented):

The device according to claim 1, wherein the flow measurement means (61) comprises a mass flow sensor (110) for measuring the mass flow through the sensor (50) and the flow correction means (62) comprises a computing means (111) for mathematically correcting the measured temperature difference for a measured mass flow variation.

Claim 8 (Currently Amended):

The device according to claim 6, wherein the mass flow sensor(110) comprises a coriolis[-], an ultrasonic or a sonic nozzle mass flow sensor.

Claim 9 (Previously Presented):

The device according to claim 1, further comprising a temperature correction means to correct for an absolute temperature variation in the flowing substance.

Claim 10 (Previously Presented):

The device according to claim 9, wherein the temperature correction means comprises a temperature measurement means and a calculation means (122) for mathematical correction of the measured temperature difference over the sensor (50) for a measured absolute temperature variation.

Claim 11 (Previously Presented):

The device according to claim 1, further comprising a pressure correction means to correct for an absolute pressure variation in the flowing substance.

Claim 12 (Currently Amended):

The device according to claim 11, wherein the pressure correction means comprises a pressure control for maintaining a substantially constant absolute pressure in the flowing substance.

Claim 13 (Previously Presented):

The device according to claim 1, wherein the flow measurement means (61) comprises a pressure measurement cell (90) for measuring a pressure difference over the temperature difference sensor (50), and further comprising a temperature correction means to correct for an absolute temperature variation in the flowing substance and a pressure correction means to correct for absolute pressure variations in the flowing substance.

Claim 14 (Previously Presented):

The device according to claim 1, wherein the transport duct (30) is mounted as a by-pass (140) on a main duct(141) in which a part of the substance flows from the main duct through the transport duct and sensor and back into the main duct.

Claim 15 (Previously Presented):

The device according to claim 1, further comprising a switch (160) for switching on and off the flow control means, wherein, in an off-position, the device measures a flow rate of the flowing substance through the transport duct.

Claim 16 (Currently Amended

The device according to claim 15, further comprising a means for intermittently switching the switch to the on- and the off position and a means to control the flow rate of the flowing substance in the off-position of the switch at a level determined by a characterising feature of the flowing substance determined in the on-position of the switch.

Claim 17 (Previously Presented):

A method of use of the device according to claim 1, comprising:

- flowing a substance through the device of claim 1; and
- identifying the flowing substance.

Claim 18 (Previously Presented):

A method of use of a device according to claim 1, comprising:

- flowing a fuel substance through the device of claim 1; and
- controlling the flow of the fuel substance to deliver a controlled heat of combustion.

Claim 19 (Previously Presented):

A method of use of a device according to claim 1, comprising:

- flowing a substance through the device of claim 1; and
- determining a heat capacity of the flowing substance.

Claim 20 (Previously Presented):

A method of use of a device according to claim 1, comprising:

- flowing a substance through the device of claim 1; and
- identifying a source or supplier of the flowing substance.

Claim 21 (Currently Amended):

A method for the characterisation of a flowing substance comprising:

- ~~Locally~~ locally heating or cooling a substance flowing through a transport duct by a heating or cooling element,
- ~~Determining~~ determining a temperature difference in the flowing substance upstream and downstream of the heating or cooling element,
- ~~Controlling~~ controlling mass flow of the flowing substance in the transport duct by measuring a mass flow characteristic and correcting for measured variations in the mass flow characteristic, and
- ~~Comparing~~ comparing the measured temperature difference with corresponding temperature differences measured on one or more calibration substances for evaluating a characterising feature of the flowing substance.

Claim 22 (Previously Presented):

The method according to claim 21, wherein the measured mass flow characteristic comprises a pressure difference over the heating-or cooling element and further comprising correcting the mass flow for a measured pressure difference variation to maintain a substantially constant pressure difference over the element.

Claim 23 (Previously Presented):

The method according to claim 21, wherein the measured mass flow characteristic comprises a pressure difference over the heating-or cooling element and further comprising correcting mathematically the measured temperature difference for a measured pressure difference variation.

Claim 24 (Previously Presented):

The method according to claim 21, wherein the measured mass flow characteristic comprises a real mass flow rate in the transport duct measured with a mass flow sensor and further comprising correcting the mass flow rate for a measured mass flow rate variation to maintain a substantially constant mass flow rate.

Claim 25 (Previously Presented):

The method according to claim 21, wherein the measured mass flow characteristic comprises a real mass flow rate in the transport duct measured with a mass flow sensor and further comprising correcting mathematically the measured temperature difference for a measured mass flow rate variation.

Claim 26 (Previously Presented):

The method according to claim 21, wherein the measured mass flow characteristic comprises a pressure difference over the heating-or cooling element and further comprising correcting the mass flow rate for the measured pressure difference variation to maintain a substantially constant pressure difference over the element, and correcting for absolute temperature variations and absolute pressure variations in the flowing substance.

Claim 27 (Previously Presented):

The method according to claim 21, further comprising identifying the flowing substance by retrieving from a database the identity of the calibration substance with the best corresponding temperature difference measurement.

Claim 28 (Previously Presented):

The method according to claim 21, wherein the flowing substance is a natural gas and further comprising:

- characterising the natural gas by measuring the temperature difference; and
- retrieving from a database or function, relating temperature difference measurements of different natural gasses with one or more characterising features of said natural gasses.

Claim 29 (Previously Presented):

The method according to claim 28, wherein the database or function comprises the heat of combustion of calibration gasses and further comprising using the temperature difference measurement to determine the heat of combustion of the gas.

Claim 30 (Previously Presented):

A method for a combustion of a combustion gas, comprising:

- characterizing the combustion gas according to method claim 29; and
- mixing the combustion gas with an oxygen containing gas in a mixing ratio based on the measured temperature difference for the combustion.

Claim 31 (Previously Presented):

The device according to claim 3, wherein the flow measurement means (61) comprises a pressure measurement cell (90) for measuring a pressure difference over the temperature difference sensor (50) and the flow correction means (62) comprises a pressure difference control means (91) for maintaining a substantially constant pressure difference over the temperature difference sensor.

Claim 32 (Previously Presented):

The device according to claim 3, wherein the flow measurement means (61) comprises a pressure measurement cell (90) for measuring a pressure difference over the temperature difference sensor(50) and the flow correction means (62) comprises a computing means for mathematically correcting the measured temperature difference for a measured pressure difference variation.

Claim 33 (Previously Presented):

The device according to claim 3,wherein the flow measurement means (61) comprises a mass flow sensor(110) measuring the mass flow through the temperature difference sensor (50) and the flow correction means (62) comprises a mass flow control means (91) for maintaining a substantially constant mass flow through the temperature difference sensor (50).

Claim 34 (Previously Presented):

The device according to claim 3, wherein the flow measurement means (61) comprises a mass flow sensor (110) measuring the mass flow through the sensor (50) and the flow correction means (62) comprises a computing means (111) for mathematically correcting the measured temperature difference for a measured mass flow variation.

Claim 35 (Currently Amended):

The device according to claim 7, wherein the mass flow sensor (110) comprises a coriolis[-], an ultrasonic or a sonic nozzle mass flow sensor.

Claim 36 (Previously Presented):

The device according to claim 3, wherein the flow measurement means (61) comprises a pressure measurement cell (90) for measuring a pressure difference over the temperature difference sensor (50), and further comprising a temperature correction means to correct for an absolute temperature variation in the flowing substance and a pressure correction means to correct for absolute pressure variations in the flowing substance.

Claim 37 (Previously Presented):

The device according to claim 4, further comprising a temperature correction means to correct for an absolute temperature variation in the flowing substance and a pressure correction means to correct for absolute pressure variations in the flowing substance.

Claim 38 (Previously Presented):

The device according to claim 5, further comprising a temperature correction means to correct for an absolute temperature variation in the flowing substance and a pressure correction means to correct for absolute pressure variations in the flowing substance.

DRAWING AMENDMENTS

Enclosed herewith please find a new sheet bearing figure 3. Figure 3 shows oxygen and combustion gas being mixed according to the ration based on the measured temperature difference. No new matter has been introduced.